

### Abstract of the Disclosure

An apparatus for very high performance space-time array reception processing using chip-level beamforming and fading rate adaptation is disclosed. The space-time array receiving system includes a plurality of digital beamforming networks for forming beams of signals by spatial-filtering the signals, to thereby generate spatial-filtered signals; a plurality of demodulating unit for demodulating the spatial-filtered signals to generate demodulated signals; correlating unit for estimating a fading channel signal based on pilot channel signals; Doppler frequency estimating unit for estimating Doppler frequency of the fading channel signal to generate Doppler frequency estimated values; correlation length selection unit for selecting a correlation length of the pilot channel signals based on the Doppler frequency estimated values; a plurality of reference signal generation unit for generating reference signals based on output signals from the correlating unit; and a plurality of weight vector estimating unit for generating weight vectors based on the reference signals and the signals and for providing the weight vector to the digital beamforming networks.